

REMARKS

The Office Action of July 20, 2005 has been received and its contents carefully noted.

The present application discloses an improved way to etch a via hole in a low-k film. As is shown in Figures 1 and 2 of the application's drawings, the improvement dramatically reduces the depth L of a trench around a hump that tends to be formed at the bottom of a hole during plasma etching of a low-k film.

The present Amendment revises independent claims 1 and 5 in two respects. First, these claims have been amended to recite a pressure of 60 to 70 mTorr, instead of 60 mTorr or higher. Secondly, both claims have been amended to recite a power level of 400 to 600 watts, instead of 600 watts or less. Support for both of these revisions can be found (for example) in the paragraph at page 5 of the present application, lines 19-23.

Section 2 of the Office Action rejects independent claims 1 and 5 (along with their dependent claims) for anticipation by a published U.S. application to Li et al. This reference will hereafter be called simply "Li." For the reasons discussed below, it is respectfully submitted that the inventions now defined by claims 1 and 5 are patentable over this reference.

As was noted above, claims 1 and 5 now both recite a pressure range of 60 to 70 mTorr and a power of 400 to 600 watts. In paragraph [0034], Li discloses a power level on the order of 50 to 1,000 watts. In paragraph [0035], Li discloses a pressure of 60 to 200 mTorr. Accordingly, the reference overlaps what is claimed in claims 1 and 5. However, Li's 60-200 mTorr pressure range is 14 times as large as the 60-70 mTorr pressure range recited in claims 1 and 5, and Li's 50-1,000 watt power range is almost

five times as large as the 400-600 watt power range specified in claims 1 and 5. That is, Applicant has discovered that a small portion of the pressure range disclosed by Li, along with a small portion of the power range disclosed by Li, leads to a remarkable improvement in the trench depth L.

The Li reference contains no disclosure regarding the trench depth L. It is respectfully submitted that the reference neither discloses nor suggests the surprising improvement that results when a low-k film is subjected to plasma etching using the combination of pressure and power that are recited in independent claims 1 and 5. Accordingly, these claims should be allowed.

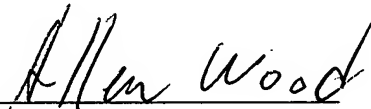
Section 3 of the Office Action rejects independent claim 10 (along with its dependent claims) for anticipation by a published application by Tsai et al (which will hereafter be called “Tsai”). It is respectfully submitted that claim 10 is patentable over Tsai, though, for the reasons discussed below.

Independent claim 10 recites the step of “forming an interconnection groove for embedding the second interconnection in the interlayer insulating film comprising the low-k film” (emphasis supplied). In contrast, the Tsai reference uses two dielectric layers 16 and 20 that are separated by etch stop layers 18a,b. Section 3 of the Office Action identifies Tsai’s layer 16 as the inner layer insulating film of claim 10. But the opening portion corresponding to the interconnection groove is formed in Tsai’s layer 20. When the Tsai reference is interpreted appropriately with respect to the language of claim 10, it is respectfully submitted that Tsai’s interconnection groove is formed in his dielectric layer 20. Claim 10 should therefore be allowed.

Since the remaining claims depend from the independent claims discussed above and recite additional limitations to further define the invention, they are patentable along with their independent claims and need not be further discussed.

For the foregoing reasons, it is respectfully submitted that this application is now in condition for allowance. Reconsideration of the application is therefore respectfully requested.

Respectfully submitted,

A handwritten signature in cursive script that reads "Allen Wood". The signature is written in dark ink and is positioned above a horizontal line.

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